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FPM Technology Update

Issue No. 91-1

April 1991



FPM Develops Forest Health Logo

Continuing awareness in the Forest Service of a responsibility to enhance and maintain a healthy forest condition has led to a focus on "forest health." In keeping with this interest in seeing that the forest health vision is achieved, Jim Space, FPM Director, recently requested that a



forest health logo be designed by FPM. The logo, which reads "Healthy Forests Make A World Of Difference," will be available to the Forest Service and its cooperators via clip art. Camera-ready art logos are currently being developed by MAG. For further information, contact Bill White at (303) 498-1777.

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FPM Cooperates in National Environmental Education Effort

The USDA Forest Service, the University of Arizona, and the Wilderness Society have jointly developed "The Green Scene," a set of environmental education modules designed for use in elementary school classrooms. The first module kit, Forest Ecology and Wilderness, has been advertised in teachers' publications and is available for \$5.00 to schools nationwide from the School for Renewable Natural Resources, University of Arizona, Tucson, AZ 85721. The kits are targeted to 5th and 6th grade students and are

designed to appeal to urban as well as rural classrooms. Future module kits will cover topics such as Wildlife and Endangered Species, Forests and Global Climate, Recreation and Cultural Resources, and Forest Management and Products. Each kit contains individual lessons and a supporting video.

The overall goal of the cooperative effort is to raise awareness, knowledge, and concern for the environment and for human interdependence with the environment. MAG plans to purchase several of the first module kits to use in public information and educational efforts. For more information, contact Bill White, (303) 498-1777. □

For Your Information . . .

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The Forest Pest Management Methods Application Group publishes *FPM Technology Update* semi-annually and distributes it nationally to FPM personnel and others interested in forest pest management. The newsletter seeks to link FPM/MAG with field personnel and inform them of program activities and status, model availability, upcoming models and their release dates, and current related news. We invite your comments and suggestions on how we can keep you informed and better serve you. If you have items of interest or comments, or wish to be added to our mailing list, contact:

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FPM Cooperators

In this and forthcoming issues of the FPM Technology Update, feature stories will be presented focusing on various cooperators who work with MAG. These cooperators include States, Federal research groups, universities, and private individuals.



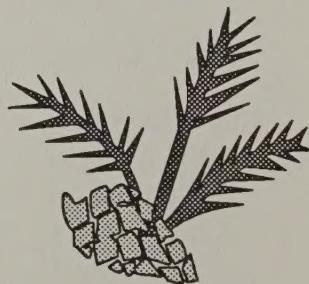
Pest Research Vital to Forest Planning Process

MAG and the Pest Impact Assessment (PIA) Technology research work unit (RM project 4501) of the Rocky Mountain Forest and Range Experiment Station have teamed up on various projects since the research group was formed five years ago. For each cooperative effort, the PIA work unit provides research input that enables MAG to develop the decision support systems that structure pest impact information for use in forest management. In addition to its work with MAG, the PIA research work unit combines its efforts with numerous cooperators, including all western regional FPM groups, the BIA, the State of Colorado, various

universities nationwide, and agencies and institutions in Canada and Australia.

Under the direction of Terry Shaw, the PIA research work unit is responsible for developing methods for assessing the impacts of insect and disease pests on forest trees, and incorporating information on the impacts of forest pests into land management guidelines. Several areas of pest impact research in which the PIA research work unit has been active include basic and applied studies on dwarf mistletoe, root disease, hard pine rust, and western spruce budworm. While past PIA research work unit responsibilities have involved forests of the Interior West, the work unit currently addresses West-wide needs, with projects today in every western region.

Besides involvement in ongoing research, the PIA research work unit regularly receives inquiries from outside sources. FY 90 outside information requests totaled over 600 and included inquiries from the USFS and other Federal agencies, State Forest agencies, universities, individuals, and foreign countries. Contact Terry Shaw at (303) 498-1251 for additional information. □



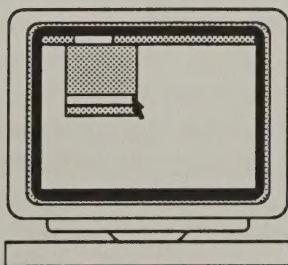
For Your Information . . .

STARR LAB Conducts Research in Range and Natural Resource Management Applications

The Texas A&M University STARR (Systems Technology And Renewable Resource) LAB is one of the many university groups with whom MAG cooperates. The LAB, under the direction of MAG, produced and designed the INFORMS (INtegrated FOrest Resource Management System) demonstration program to illustrate the user interface and proposed features of INFORMS. MAG introduced the demo in November 1990 at the Resource Technology 90 international symposium in Washington, DC.

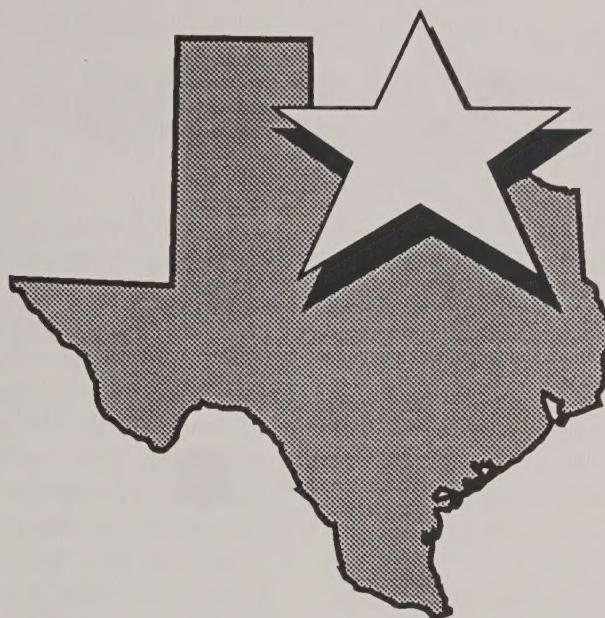
The STARR LAB, in the Department of Rangeland Ecology and Management, was developed to facilitate and conduct research in information technology in range and natural resources and conducts programs in four primary areas:

- Integrated knowledge-based systems to manage natural resources
- Geographic information systems to examine the principles of landscape ecology and management
- Innovative methodologies to simulate animal, plant, and socio-economic systems
- Evaluation/development of advanced computer



technology to implement the above tasks
Douglas K. Loh, Assistant Professor in Rangeland Ecology and Management, directs the LAB. Dr. Loh's background in forestry, together with his familiarity with knowledge engineering, geographic information systems, and integrated resource management led to the conception of the STARR LAB. The LAB provides programming support to various federal projects and to the Department of Rangeland Ecology and Management. The STARR LAB's goal is to create products with intelligent, user-friendly interfaces to be of use to resource managers in the field without requiring extensive training. The LAB also seeks to make these products inexpensive by targeting them for low-cost PC/workstations.

The STARR LAB conducts research in advanced computer applications to produce prototype systems for its customers. The LAB has been involved in several projects:



- IRMA (Integrated Resource Management Automation), with the Nicolet National Forest
- JPBWDSS (Jack Pine Budworm Decision Support System), with the Hiawatha National Forest
- INFORMS-TX (Integrated Forest Resource Management System in Texas), with the National Forests in Texas and Region 8 FPM
- INFORMS Specification and User Interface Analysis, with Forest Pest Management
- Environmental Geology Information Resource System, with the Industrial Technology Research Institute in Taiwan
- Integrated Management of Rangeland Resources in North Texas, with the Texas Agricultural Experiment Station

The STARR LAB is a resource of the Texas Agricultural Experiment Station. □

For Your Information . . .

Welcome

Laura Disbrow has joined the MAG staff as a program analyst in the Systems Development Program. Laura has over 21 years of experience with the Forest Service, and has spent the majority of that time on the Nicolet National Forest in northern Wisconsin. Laura's interest in computer technology led her to enroll in evening classes and eventually paved the way for a career change from business management to GIS and information management. From 1984 until 1989 she was the GIS coordinator for the Nicolet. Her GIS experience provided the opportunity to participate in numerous details over the last several years. These included WO task forces, the Silver Fire Recovery Project, Mt. Hood GIS Coordinator for Land Management Planning, R2 Engineering, and the MAG Systems Development Program.

Laura's activities at MAG include participating in INFORMS development, installing and learning about UNIX, coordinating and distributing the INFORMS Demo, and establishing a communication network among FPM staff around the country.

Dave Roschke has joined the Systems Development Program of MAG as a computer specialist. His MAG responsibilities include helping to plan, design, develop, program, and analyse forest pest management planning systems

tools and resource analysis techniques at the regional and national forest levels.

Dave first worked with the Forest Service as a seasonal firefighter on the Angeles National Forest. While working toward his B.S. degree in Forestry, Dave was a co-op student/forester trainee at Humboldt State University in California. Upon graduation, Dave became involved with pre-sale planning for timber sales working as a planning forester on the Stonyford Ranger District on the Mendocino National Forest in Region 5. Prior to joining MAG, Dave spent five years as the Data General system and applications software manager in the Supervisor's Office of the Wallowa-Whitman National Forest in Region 6.

The Resource Technology Institute (RTI) would like to welcome **Sindy Coley**, the new executive director for RTI. Sindy comes from Techline Studio Colorado, where she served as studio manager. Sindy will be responsible for organizing the Resource Technology international symposiums and will also take care of various business operations for RTI. Janette Evans, former executive director for RTI, has accepted a position with First Investors Corporation as a registered representative.

Workshop Brings Together Participants in Forest Planning Process

Washington Office Land Management Planning (WO-LMP), Washington Office Timber Management (WO-TM), and MAG conducted a joint workshop February 12-14 in Fort Collins, Colorado. Over 70 regional and forest planners, pest management specialists, and growth and yield specialists attended. The purpose of the workshop was to illustrate the forest planning process from the perspectives of the three groups. Speakers from WO-LMP presented an overview of FORPLAN yield tables and the information required for these tables. WO-TM gave an overview of the growth and yield models and how outputs from the models are used to construct FORPLAN yield tables. MAG discussed the importance of integrating pest impacts into the planning process and reported on the status of current pest models.

Janette Savidge, computer programmer for MAG, said the workshop helped participants gain a better understanding of the different components of the forest planning process and the tools available within each discipline. During one afternoon, participants broke into groups to analyze the processes used in the last forest planning effort, identify problem areas, and recommend improvements for the future. Another discussion emphasized validation in three areas: outputs from growth and yield tables, cross-stratification

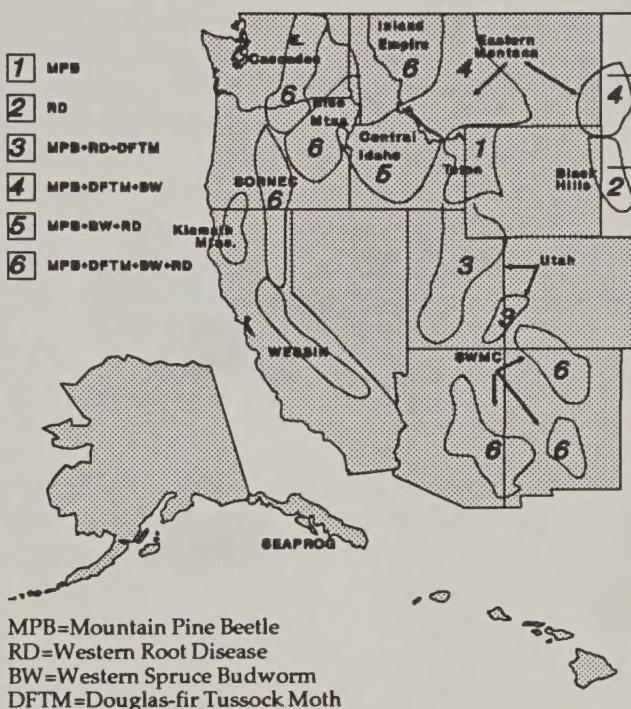
See Workshop on page 5

Quantitative Techniques Program

MAG Updates Pest Model Variants for Prognosis

The revised January 1991 Prognosis-Pest Model map shows Prognosis-Pest models which are currently available for execution on the Data General and Unisys at the National Computer Center at Fort Collins (NCC-FC). Conversion from Unisys to IBM at the NCC-FC is in progress, with IBM versions of the models expected to be active and Unisys programs to be inaccessible by mid-summer 1991. Questions on the NCC-FC conversion or on Prognosis-Pest models can be directed to the Prognosis-Pest regional contacts identified in the September 1990 newsletter, or by contacting Janette Savidge at (303) 498-1727. □

AVAILABILITY OF PROGNOSIS-PEST MODELS (Revised 01/91)



MPB=Mountain Pine Beetle
RD=Western Root Disease
BW=Western Spruce Budworm
DFTM=Douglas-fir Tussock Moth

Interim Dwarf Mistletoe Impact Model Available for Testing

The new Dwarf Mistletoe Impact Model is being developed as a cooperative effort by MAG, the Rocky Mountain Station, WO-TM, and several FPM regional staffs. An improved and more comprehensive model for simulating dwarf mistletoe spread, intensification, mortality, diameter growth modification, and other areas of impact will benefit forest pest managers and silviculturists.

Current efforts are geared toward developing an interim integrated mistletoe/stand development model for silvicultural planning, and

producing associated program and user documentation. Progress in developing the Interim Dwarf Mistletoe Impact Model includes a new mortality prediction routine, a new diameter growth modification function, enhancements to the existing intensification model, and production of new mistletoe data analysis output tables. The Interim Dwarf Mistletoe Impact Model has been linked into Prognosis and contains several new keywords for Prognosis users. Mistletoe keyword quick-reference documentation is available on the Data General. On-site testing of 12 of the 14 variant models is currently in progress, with a few models actually in use in the field. Sites interested in testing the interim

model should contact Julie Williams-Cipriani at (303) 498-1733. □

Workshop - continued from page 4

between growth and yield models (stand-based) and FORPLAN (area-based), and FORPLAN outputs.

Through avenues such as this workshop, groups involved in the forest planning process can gain a better understanding of each other's roles in the overall planning effort. Increased understanding can ease the transition of data between models, resulting in more effective forest planning. For information, contact Janette Savidge at (303) 498-1727. □

Quantitative Techniques Program

MAG and Region 1 Hold White Pine Blister Rust Workshop

In February of this year, the White Pine Blister Rust (WPBR) Model Workshop was held in Spokane, WA. The workshop was organized by MAG and Region 1 FPM and facilitated by Eagle Systems of Alexandria, VA. The purpose of the workshop was to describe and demonstrate the WPBR prototype model on test stands, evaluate its behavior, and recommend modifications for use in the Northern, Pacific Northwest, and Pacific Southwest regions. The workshop was an opportunity for a select group of resource and pest management specialists from



universities and Federal and State agencies in the United States and Canada to contribute their knowledge of WPBR disease, silviculture, and modeling through active participation in workshop discussions. Key participants included John Schwandt and Jim Byler from Region 1 FPM, and Geral McDonald and Al Stage from the Intermountain Forest and Range Experiment

Station. Results of the workshop were compiled by Eagle Systems and submitted to MAG as a draft report. Future modifications to the WPBR model will be done based on recommendations described in Eagle System's final report. For information on the workshop, contact Lance David, (303) 498-1728.

□

Revisions to White Pine Blister Rust Model Continue

The existing damage model for blister rust on western white pine, developed at the Intermountain Forest and Range Experiment Station, is currently being evaluated for use in Regions 1, 5, and 6. Based on cooperators' initial recommendations, MAG has revised the model code. The original blister rust code has been linked with the Prognosis Northern Idaho variant and is operational. Additional assessments were recently made

at the White Pine Blister Rust Model Workshop (see above story). MAG continues to implement appropriate model code changes while cooperators fulfill research needs. Additional efforts by MAG are expected throughout the remainder of this fiscal year as cooperators provide solutions to problems identified at the workshop. With its linkage to the Prognosis Growth and Yield Model, the White Pine Blister Rust Model will be used extensively to plan and evaluate stand prescriptions. For additional information, contact Lance David at (303) 498-1728.

□

QTP Releases Permanent Plot Catalog

MAG has released the first draft of the "Catalog of Western Permanent Plots for Pest Impact Assessment." The catalog was developed to organize existing permanent plot data (FPM and non-FPM from the western regions) to determine if FPM can use the data to validate, calibrate, and develop pest models.

The catalog is broken into several sections: permanent-plot system questionnaires which include plot location, area description, plot/study design, data and plot accessibility, and the types of data collected on each plot; a pest index which lists pests that occur on permanent plot systems, with emphasis on western root disease, dwarf mistletoe, western spruce budworm, and mountain pine beetle; a purpose index which lists the original purpose for establishing each of the plot systems; and a tree species index which lists tree species found on the different plot systems. The catalog also includes references and additional information that the regions returned with the questionnaires.

MAG is currently developing a permanent-plot data base to improve permanent-plot data management. A data base located within each region will ensure data integrity, and will enable users to perform complex queries and generate reports.

A second draft of the catalog is scheduled for release at the end of April 1991. For more information on the catalog, contact Renee' Platz, (303) 498-1754.

□

Systems Development Program

INFORMS Projects Support Forest Planning and Management

Producing an integrated set of tools which would support project-level planning has challenged several Forest Service/University cooperations. Such a challenge has been faced in the development of INFORMS (INtegrated FOrest Resource Management System). INFORMS was designed to give forest resource specialists an easy-to-use tool which enables them to incorporate forest pest management concerns into the forest planning and management process.

The need for integrated systems is reflected in the number of similar projects and the overall enthusiasm prospective users have for the projects. The recommendations for meeting the future challenges of Land Management Planning as stated in the June 1990 "Critique of Land Management Planning" included the use of analytical tools. The Critique stressed a need to enhance and improve our analytical tools and procedures and to match analytical tools to the land management planning questions at hand. Discussions held with Larry Leefers, Associate Professor, Michigan State University, indicate that examples of integrated systems provide an insight regarding the direction of future analysis tools. Professor Leefers prepared a report entitled "A Description and Evaluation of National Forest Plan Implementation Technologies" at

the request of the Office of Technology Assessment. The report is due to be released in June 1991 and is an excellent source of background and future needs required to meet the challenges of implementing forest plans.

The development approach to INFORMS is a blending of new methods and proven sequences of systems development. The blended approach focuses on the value of feedback obtained from the deployment and testing of prototype systems, and the control and cost management obtained

Each of the INFORMS projects makes unique contributions toward developing an integrated system that supports project planning.

through more conventional systems life cycle techniques. INFORMS specifications are derived from user and developer feedback gathered through regional/area technology development projects. Although Forest Service units have developed these projects on distinctly different versions of hardware and software, they all directly address the functions and concepts of INFORMS.

Each of the INFORMS-related projects makes unique contributions toward developing an integrated system that supports field unit project planning. Some of the projects focus on the challenges of integrating data and

models across natural resource disciplines. Other projects focus specifically on single-pest modeling and decision support while using various technologies only where they are required to solve pest-specific problems.

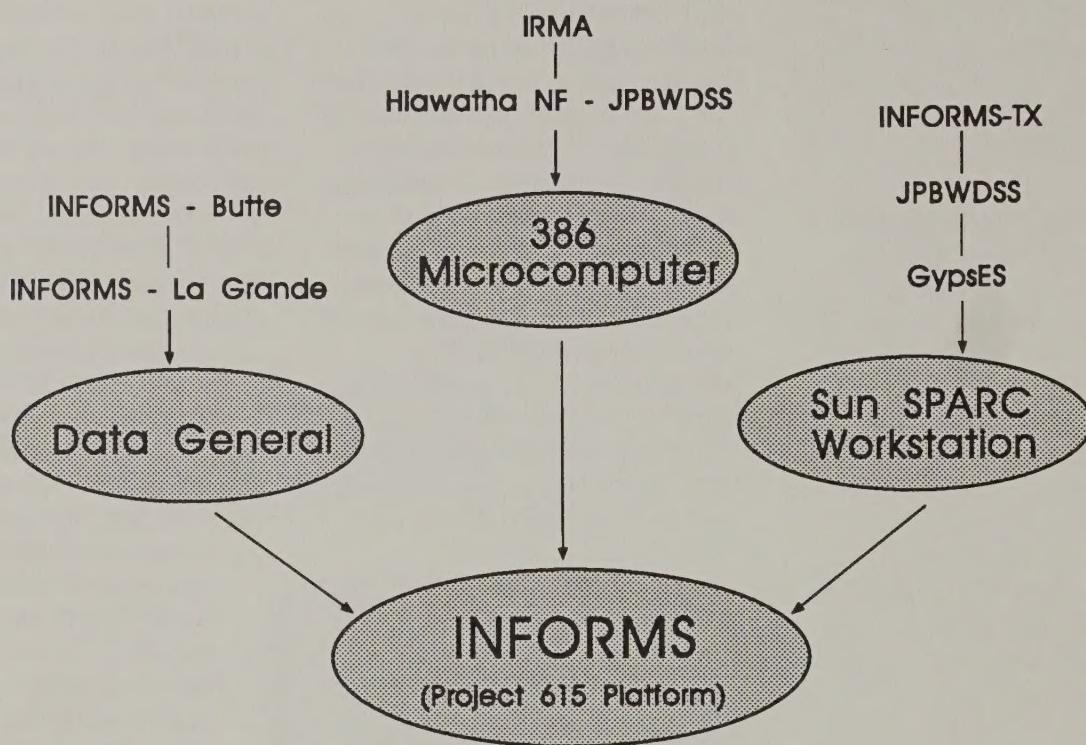
INFORMS is intended to fit into the current Forest Service computing environment in order to use available hardware and software. INFORMS will simplify the accessibility and utility of otherwise very complex commercial and scientific software (e.g., geographic information systems, relational database systems, scientific models, and expert systems). There are many technical and social challenges FPM and the rest of the Forest Service must face together to realize the lofty goals of INFORMS.

Several ongoing projects are designed to meet these challenges (see diagram on page 8). Although these projects use different computing environments, their goals are the same — to meet the project planning needs of the district resource specialists.

DATA GENERAL. Initiated in 1985, INFORMS-DG uses data from FPM projects on the Red River Ranger District (Nez Perce NF), the Butte Ranger District (Deerlodge NF), and the La Grande Ranger District (Wallowa-Whitman NF). INFORMS-DG is unique in its use of models. INFORMS-DG uses the Prognosis Stand Growth and Yield Model and the pest extensions which have been implemented in the Data General computing environment.

See INFORMS on page 8

Systems Development Program



INFORMS - continued from page 7

INFORMS-DG also models other resources. These resource models have been developed from field trials on a case-by-case basis as project personnel perceived a need for certain models and as the project funding covered the expense of developing, interpreting, and coding models. One very popular feature of INFORMS-DG is the display of vegetation on a terrain model. This capability is part of the Visual Impact Model.

In 1990, the Butte Ranger District (RD) used the INFORMS-DG application to support the environmental assessment of the Lime Kiln Timber Sale. The La Grande RD is beginning an environmental assessment of the Five Points Area and will use INFORMS-DG to support that assessment.

386 MICROCOMPUTER. Initiated in 1987, the PC-based IRMA system is a microcomputer application which was developed using Microsoft Windows 2.1 with DOS. It is referred to as INFORMS-PC. The system relies on CLIPS (expert system) and manages data through RBase. This system was developed through the Region 9 Nicolet National Forest. In 1989, the IRMA software was easily transformed into the Hiawatha National Forest Jack Pine Budworm Decision Support System (JPBWDSS). These projects were administered by the Nicolet NF and FPM St. Paul field office respectively. This system has terrific potential for packaging small subsets of INFORMS components. The components would then be sent to pest specialists in states and/or Forest Service units where a needs assessment indicates components may satisfy small-scale project

needs. Texas A&M is independently converting the components of this application to Microsoft Windows 3.0, the current commercial version of Windows.

SUN WORKSTATION. In 1989, Region 8, MAG, and the National Forests in Texas began developing a system which would most closely meet 615 procurement specifications. A workstation will be used to meet software and hardware requirements identified in earlier systems which cannot be met with a microcomputer and DOS. Two FPM projects are coordinated for development on a Sun Sparc 1+ Workstation; INFORMS-TX, which is administered through the Region 8 FPM office, and the JPBWDSS, which is administered through the St. Paul FPM field office and MAG, in cooperation with Forestry Canada.

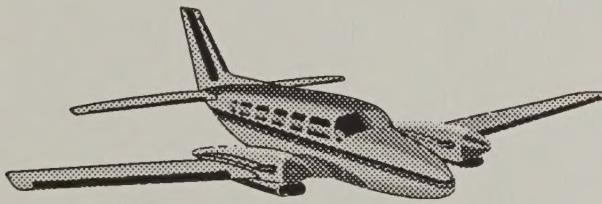
See INFORMS on page 9

Remote Sensing Program

Remote Sensing Develops Airborne Video Package

The Remote Sensing Program has developed a consolidated procurement package for a complete airborne video image acquisition system. The package is to be used as a remote sensing tool to support aerial surveys.

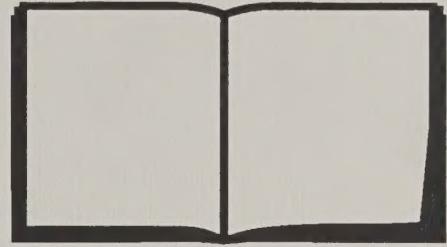
Under the current procurement package (for fiscal year 1991), six systems will be available on a first-come, first-served basis. A second procurement package for



next year will provide an unlimited number of units.

Many of the components that comprise the system are commercially available from various vendors, while a few components that are essential to linking the system together have been developed by MAG. The consolidated package will simplify the transfer and implementation of airborne video technology. It will also ensure that the users of an airborne video image acquisition system will have all the correct components, and that the system will function as it was designed and field tested. For further

information on price and procurement procedures, contact Dick Myhre, (303) 498-1778. □



Publications and Reports

Catalog of Western Permanent Plots for Pest Impact Assessment; USDA Forest Service, Forest Pest Management, Methods Application Group. MAG Report: 91-1. For copies of this report, see editors' address on page 4 of this newsletter.

Proceedings: Resource Technology 90. Second International Symposium on Advanced Technology in Natural Resource Management; 1990 November 12-15. Washington, DC. 830 p. Available from:

American Society for Photogrammetry and Remote Sensing
5410 Grosvenor Lane, Suite 210
Bethesda, MD 20814-2160
(412) 772-0070
Stock #: 4525
The cost is \$45 for ASPRS members and \$70 for nonmembers.

Critique of Land Management Planning; June 1990. USDA Forest Service, Policy Analysis Staff, Washington, DC. 11 volumes. For copies of this report, contact the Policy Analysis Staff, (202) 447-6532.

Forest Health Through Silviculture and Integrated Pest Management: A Strategic Plan; USDA Forest Service, Forest Pest Management. Washington, DC. For copies of this report, see editors' address on page 4 of this newsletter. □

INFORMS - continued from page 8

In the JPBWDSS project, the system will be used to predict time, location, and severity of jack pine budworm outbreaks and will help managers select silvicultural and other control options.

INFORMS-TX is designed to help implement and monitor the Texas National Forests' land management plans. The system will integrate spatial and tabular data with knowledge-based systems and simulation models under a standard user interface.

INFORMS DEMO. The STARR LAB at Texas A&M University (see story on page 3) and MAG have developed an INFORMS demonstration program to illustrate the user interface and proposed features of INFORMS.

The demo runs on any 386 microcomputer with VGA graphics and simulates an INFORMS session. The STARR LAB distributed a user questionnaire with the demo to encourage feedback from potential users of INFORMS, concerning both the demo and INFORMS itself. MAG introduced the demo package in November 1990 at the Resource Technology 90 international symposium in Washington, DC, and also distributed it to all FPM field offices through the regional offices in March 1991. For further information on INFORMS projects, contact Patrice Janiga, (303) 498-2311. □

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